CLAIM AMENDMENTS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) An optical apparatus, comprising:

an unitary waveguide section having a first lateral dimension perpendicular to a propagation axis;

a offset waveguide section optically coupled to the unitary waveguide section, the offset waveguide section having a second lateral dimension approximately equal to twice the first lateral dimension; and

two branching waveguide sections each having first ends and second ends, the first ends optically coupled to the offset section, wherein the unitary waveguide section, the offset waveguide section, and the two branching waveguide sections comprise a silicon-on-insulator ("SOI") structure.

2. (Original) The optical apparatus of claim 1 wherein the two branching waveguide sections are approximately tangent to each other at a splitting point of the first ends and diverge at the second ends.

3. (Original) The optical apparatus of claim 2 wherein a first center of the first lateral dimension of the unitary waveguide section is substantially aligned with a second center of the second lateral dimension of the offset waveguide section.

4. (Original) The optical apparatus of claim 1 wherein the unitary waveguide section comprises a single mode waveguide section.

5. (Original) The optical apparatus of claim 1 wherein the offset waveguide section supports propagation of a double mode of an optical signal.

6. (Original) The optical apparatus of claim 5 wherein the offset waveguide section supports simultaneous propagation of a fundamental mode and the double mode of the optical signal.

7. (Currently Amended) The optical apparatus of claim 6 wherein the offset waveguide section has a length parallel to the propagation axis such that a combined electric field of the fundamental mode and the double mode of the optical signal has two peaks offset [[from]]about a center of the offset section when the optical signal reaches the first ~~and second~~ ends of the two branching waveguide sections.

8. (Cancelled)

9. (Original) The optical apparatus of claim 1 wherein the unitary waveguide section, the offset waveguide section, and the two branching waveguide sections have substantially rectangular cross-sections.

10. (Original) The optical apparatus of claim 1 wherein a transition between the unitary waveguide section and the offset waveguide section is abrupt.

11. (Original) The optical apparatus of claim 1 wherein a transition between the unitary waveguide section and the offset waveguide section is gradual.

12. (Original) The optical apparatus of claim 1 wherein the two branching waveguide sections comprise single mode waveguides each having a third lateral dimension approximately equal to the first lateral dimension of the unitary waveguide section.

13. (Currently Amended) A method, comprising:

propagating an optical signal having a single mode of propagation along a first waveguide section;

expanding the optical signal to have a double mode of propagation in a second waveguide section; and

splitting the optical signal having the double mode of propagation into two separate optical signals propagating along branching waveguide sections, wherein the first waveguide section, the second waveguide section, and the branching waveguide sections comprise a silicon-on-insulator ("SOI") structure.

14. (Original) The method of claim 13 wherein expanding the optical signal to include the double mode comprises transitioning the first waveguide section to the second

waveguide section, the second waveguide section having a second lateral dimension approximately equal to twice a first lateral dimension of the first waveguide section.

15. (Original) The method of claim 14 wherein transitioning the first waveguide section to the second waveguide section comprises an abrupt transition.

16. (Original) The method of claim 14 wherein transitioning the first waveguide section to the second waveguide section comprises a gradual transition.

17. (Original) The method of claim 14 wherein the optical signal comprises a multimode optical signal in the second waveguide section, the multimode optical signal including both the single mode of propagation and the double mode of propagation simultaneously.

18. (Original) The method of claim 17 wherein splitting the multimode optical signal comprises splitting the multimode optical signal at a location where the multimode optical signal has two electric field peaks offset from a center of the second waveguide section.

19. (Original) The method of claim 13 wherein splitting the optical signal having the double mode of propagation comprises splitting the optical signal into the two separate optical signals at a splitting point defined by approximately tangent waveguide walls of the branching waveguide sections.

20. (Original) The method of claim 13 wherein the two separate optical signals propagating along the branching waveguide sections have substantially equal optical power.

21. (Currently Amended) A system, comprising:

a plurality of branching waveguides, each branching waveguide comprising:

a unitary waveguide section having a first lateral dimension perpendicular to a propagation axis;

an offset waveguide section optically coupled to the unitary waveguide section, the offset waveguide section having a second lateral dimension approximately equal to twice the first lateral dimension; and

two branching waveguide sections having first ends and second ends, the first ends optically coupled to the offset section, wherein the unitary waveguide section, the offset waveguide section, and the two branching waveguide sections comprise a silicon-on-insulator ("SOI") structure,

wherein the unitary waveguide section of each of the plurality of branching waveguides is optically coupled to one of the two branching waveguide sections of another of the plurality of branching waveguides.

22. (Original) The system of claim 21 wherein the plurality of branching waveguides comprise a plurality of Y-branch waveguides.

23. (Original) The system of claim 22 wherein the plurality of Y-branch waveguides comprises a multi-fanout "H-Tree".

24. (Original) The system of claim 21 wherein the two branching waveguide sections are approximately tangent to each other at a splitting point of the first ends and diverge at the second ends.

25. (Original) The optical apparatus of claim 21 wherein the unitary waveguide section comprises a single mode waveguide section.

26. (Original) The optical apparatus of claim 25 wherein the offset waveguide section supports propagation of an optical signal having a double mode.

27. (Original) The optical apparatus of claim 26 wherein the offset waveguide section comprises a multimode waveguide section that supports propagation of an optical signal including a fundamental mode and the double mode.